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ABSTRACT

One in a series of units of instruction for gifted students, the booklet focuses on humanities and science. Three sample units are offered for students in grades 9-12. In "Man's Origins: Where Did He Come From?" students examine the conflicts over evolution versus creationism, impacts of genetic control, and the ecomonics and politics of the population problem. The second unit, "Man's Future: Where Is He Going?" involves students in questions of utopia, behavior control, nationalism, and futurism. The final unit, "Man's Search for Immortality: Can He Overcome Death?" examines literature on death and dying, religious concepts of the savior, and empirical and rational arguments for and against immortality. Each unit begins with a listing of suggested reading and audiovisual materials. (CL)

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BUCKS COUNTY INTERMEDIATE UNIT #22

TECHNOLOGY AND MAN: THE HUMANITIES AND SCIENCE

(Selected Study Topics for Gifted Students in Grades 9-12)

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TECHNOLOGY AND MAN: SELECTED TOPICS FOR UNDERSTANDING THE HUMANITIES AND SCIENCE

Scientific concepts through the centuries have changed man's image of himself and his place in the universe. Copernicus reduced man from being the center of the universe to being an inhabitant on an obscure planet. Darwin snatched man from his throne as lord of the earth's living things and assigned him a place among the millions of other species which evolved from one another. Atomic power revolutionized man's perspective about his permanence when the possibility of a thermonuclear war that could obliviate the human race became a distinct reality.

To understand the meaning and nature of the human condition, the humanities have historically embraced literature, music, drama, the arts and the social sciences. Due to the ever increasing impact of technology on mankind, this curriculum attempts to expand the scope of the humanities to include the sciences. With each new scientific breakthrough, man's view of himself has demanded reassessment for, as Socrates observed, "The unexamined life is not worth living."

The inherent conflicts that exist between the scientist and the humanist cry out for resolution. The crux of the problem, outlined by Werner Heim, is: "The job of the natural scientist is to make the discoveries; that of the technologist is to develop applications; and that of the social scientist and humanist is to suggest whether, how, and under what conditions the work of the other two ought to be applied."

Thus, this curriculum will attempt to go beyond the realm of the objective data gathering of science into the moral, ethical and social considerations that surround man's life, evolution, future, death and immortality. This thoughtful examination of the impact of scientific technology on the quality of life is especially meaningful for gifted students since, by virtue of their intellectual and leadership potential, they will be involved, in determining the quality, or even the continuing, of life in the future. Edmund Fuller suggests: "You can be cursed with information without wisdom. You could wind up programming machines

without knowing the implications of their use naively handling instruments more sophisticated than yourselves."

On the topic of Man's Origins: Where Did He Come From? students will grapple with the philosophical question of its origin and nature. Then, since scientific knowledge now allows man to control his biological inheritance, students will examine to what extent man should tamper with genetic control. Plato addressed this question in The Republic, as did Hitler in Nazi Germany. Students will examine the rights and responsibilities that accompany more and more sophisticated scientific knowledge.

Where did man come from? What are his origins? These are complicated questions, often sensitive and emotional. Students will examine the conflict that exists between the theories of evolution and creationism. "Isn't it difficult to realize that a trial of this kind is possible in the 20th century in the United States of America?" So spoke Clarence Darrow at the famous Scopes trial in 1925 in what he considered to be overwhelming scientific evidence favoring Darwin's theory of evolution. Today, however, those who favor a creationist point of view are gaining momentum by adding scientific expertise to their moral and ethical judgments.

In the Man's Future: Where Is He Going? section, students will study optional futures that have been proposed throughout civilization. They will again confront an existing conflict: the immediate and often too-pressing needs of today versus the long-range goals of tomorrow's society. Plato suggested that the better we envision wise and fulfilling futures, the greater the chance of our dreams becoming reality. And according to futurist Fred Polak, "In the act of searching out the road into the future, man crosses the frontiers of the unknown and raises homo sapiens to a new level: the level of foresight and the purposefulness... In taking thought for tomorrow, man begins to create tomorrow."

Finally, students will address Man's Search for Immortality: Can He Overcome Death? since, it has been suggested, that how man looks at life is in large measure shaped by his perspective on death. And what about immortality? Science

has extended Western man's life expectancy by about 25 years during the last century; won't this trend continue? Alan Harrington affirms: "Death is an imposition on the human race, and no longer acceptable. Man has all but lost his ability to accomodate himself to personal extinction; he must now proceed physically to overcome it. In short, to kill death: to put an end to his own mortality as a certain consequence of being born."

"The dangers that face the world can, every one of them, be traced back to science. The salvations that may save the world will, every one of them, be traced back to science," states Isaac Asimov. It is hoped that, upon completion of this course of study on the humanities and science, students will recognize the limits of science and envision beneficial potentials of science by working through some of the moral, ethical and philosophical issues facing mankind.

Man's Origins: Where Did He Come From?

To endure life remains, when all is said, the first duty of all living beings. Illusion can have no value if it makes this more difficult for us...

Sigmund Freud

There is today--in a time when old beliefs are withering - a kind of philosophical hunger, a need to know who we are and how we got here. There is an ongoing search, often unconscious, for a cosmic perspective for humanity.

Carl Sagan

We come from a dark abyss, we end in a dark abyss, and we call the luminous interval life.

Nikos Kazantzakis

In broad terms, the destiny of man on earth has been made clear by evolutionary biology. It is to be the agent of the world process of evolution, the sole agent capable of leading it to new heights, and enabling it to realize new possibilities.

We not believe with confidence, that the whole of reality is one gigantic process of evolution. This produces increased novelty and variety, and ever higher types of organization; in a few spots it has produced life; and, in a few of those spots of life, it has produced mind and consciousness.

Sir Julian Huxley

Suggested Readings

Philosophy: An Introduction to the Art of Wondering, Christian (Chap. 6-1, pp. 342-366)
(Chap. 6-2, pp. 366-379)
(Chap. 6-3, pp. 379-393)

Classic Mythology, Morford and Lenardon
Magnificant Myths of Man, Cliffor
Bible, Genesis
Biology and the Future of Man, Handler
Childhood's End, Clarke
The Naked Ape, Morris
Worlds in the Making, Dunston and Gordon
Worlds in Collision, Veliskonsky
The Ascent of Man, Bronowski
The Origin of the Species, Darwin
Scientific Creationism, Morris
The Great Tree and the Long House, Anthropology Curriculum Study Committee
Kiowa Years, Anthropology Curriculum Study Committee
Myths, Fables and Folktales, Kitzhaber and Malarkey
Introduction to Biblical Literature, Davis
"Acceleration of Evolution", J. Platt, The Futurist, Feb. 1981.
"Born Again Lamarckism", Discover, August 1981.
"Creationists vs Evolution", Discover, May 1981.
"Evolution as Fact and Theory", Discover, May 1981.
"The Tortoise or The Hare", Discover, October 1980.
"Creationism on The Rise", Discover, October 1980.
"An Awkward Question", J. Needleman, Science 81, June 1981.
"The Cells That Would Not Die", Michael Gold, Science 81, April 1981.
"The New Age of Genetic Screening", Science '81, January 1981.
"The Cell Biology of Human Aging", Scientific American, January 1980.

Audio-Visual Materials

Darwin's Galapagos Today - 14 min. (MP2-7315)
Darwin's Finches - Clues to the Origin of the Species - 10 min. (MP1-0613)
DNA - Molecule of Heredity - 16 min. (MP2-0762)
Lower Than The Angels - 1 & 2, 25 min. each (MP3-2524 - MP3-2525)
Ladder of Creation - 1 & 2 (MP3-2536 - MP3-2537)
Theories of the Origin of Life (MP2-2856)
Tobias on the Evolution of Man (MP2-2381)

Science and Mankind:

DNA and RNA - Deciphering the Code of Life
Genetics - Observing Patterns of Inheritance
Three Billion Years of Life: The Drama of Evolution
How Life Survives: Adaptation and Evolution
The Ethics of Genetic Control
The Ethical Challenge: Four Biomedical Case Studies
The New Genetics: Rights and Responsibilities
The Miracle of All Life: Values in Biology
The Science and Ethics of Population Control: An Overburdened Earth?

Sample Activities:

1. Research the complexity of the treatment of a child born with a genetic defect by interviewing various professionals involved in the diagnosis, treatment, and care of such children. For example, with PKU one could talk with genetic counselors, doctors doing the testing of newborn babies, state legislators who introduced the bill for mandatory screening, parents of detected PKU children, and people working with children in state institutions whose PKU was not detected soon enough to prevent retardation.

2. Conduct a survey on how the community feels about various issues raised:
   --Should abortion be allowed and, if so, under what circumstances?
   --Should certain screening programs for inherited disease be mandatory; or supported by tax money?
   --Should certain groups be deprived of their right to have offspring?

3. Discuss the advantages and disadvantages of applying to humans such techniques as insertion of genes and implantation of fertilized eggs; the advantages and disadvantages of cloning and "bottle babies."

4. Focusing on the economics and politics of the population problem, complete the following scenarios:
   --The world population has reached almost critical proportions, and half of the world is on the verge of mass starvation. The United States has 1/15 the world's population, and comsumes 70 per cent of the world's natural resources. Americans are eating as much steak as ever. At a meeting of the starving nations...
   --There is still adequate oil on reserve to last another hundred years. A small, independent research firm develops a low-cost, practical solar cell which can be used in conjunction with newly developed batteries. The combination eliminates the need for the internal combustion engine in automobiles. The automobile companies learn of this and...
   --The medical research teams of one country find cures for cancer, heart, and related disease, viruses are routinely being injected to end all inborn errors of metabolism, and enough is known about the immune system so that infectious disease is wiped out. A government meeting is held to decide if this knowledge is to be made freely available to all peoples and the decision is...
   --An agricultural expert develops a different-tasting strain of wheat which contains four times the amount of protein as current types, and which reaches maturity in two-thirds the time. You are given the job of convincing people to substitute the new wheat for their present protein source. You set up a chain of wheat-burger stands and people react by...

5. Mark your position along the continuum with regard to balancing rights and responsibilities:

--Freedom of the individual	Responsibility to society
--Long, dull life	Short, exciting life
--Rights of parents	Rights of fetus
--Reasonable quality of life	Sanctity of life itself
--Rights of fetus	Rights of siblings
--Rights of parents	Obligation to future generations
--Right to life (for any fetus)	Right not to be born (for a seriously affected fetus)

6. Jean Baptiste Lamarck proposed a theory of evolution fifty years prior to Darwin, dying penniless and blind for his trouble. His theory had a unique feature, not supported by Darwin, that has gained some momentum recently.

   . Tell us what this feature is;
   . Select a trait in any animal that lends itself well to this argument
   . Be prepared to defend your argument against Darwin and the rest of the class

7. Dr. Harry Overstreet of Harvard has advaneed the idea that man is developing a higher order of consciousness, and that it has already manifested itself to a high degree in some.

   Choose one of the following and express in a paper how the individual has evidenced in his life time a "higher order of consciousness".

   Jesus
   Socrates
   Descartes
   Shakespeare
   Einstein
   Dante
   Whitman

Man's Future: Where Is He Going?

It's a poor sort of memory that only works backward.

Lewis Carroll

Anyone who wishes to cope with the future should travel back in imagination a single lifetime - say to 1900 - and ask himself just how much of today's technology would be, not merely incredible, but incomprehensible to the keenest scientific brains of that time.

Arthur C. Clarke

Suggested Readings

Philosophy: An Introduction to the Art of Wondering, Christian (Chap. 6-4, pp. 393-416)
The Republic, Plato
The Search for Personal Freedom, Vol. II, Crass, Lamm, Turk
excerpts from The Prince, Machiavelli
Utopia, More
Emile, Rousseau
Candide, Voltaire

essays on John Locke and Adam Smith
"First Inaugural Address", Jefferson
essays on the twentieth century - editors

The Authentic Person, Harris
Worlds in the Making, Dunstan and Garlan
excerpts from Looking Backward, Bellamy
Part III: Exploring Spaceship Earth
Part IV: The Machine - Enemy or Ally?
Part V: Evolution or Revolution?
Part VI: Discovering Human Nature
Part VII: Inventing the Future
The Conscious Reader, Shrodes, Finestone, Shugrue
Part VII: The World in the Future
Walden (excerpt), Thoreau
"A Very Private Utopia", Chase
"New Heaven and Earth", Joyce Carol Oates
"The Greatest Danger, the State", Jose Ortega Y Gasset
Edge of Awareness, Hcopes and Peck
"Can We Survive the Fun Revolution?", Joseph Wood Krutch
"Why I Dislike Western Civilization", Arnold Toynbee
"One Vote for this Age of Anxiety", Margaret Mead
"Can Science Prevent War?", Arthur Larson
"Science, Life, and Landscape", Paul B. Sears
The Pleasures of Philosophy, Will Durant
"Is Progress a Delusion?"
"The Destiny of Civilization"
"How We Made Utopia"
Brave New World, Aldous Huxley
1984, George Orwell
The Lord of the Flies, William Golding
The Lathe of Heaven, Ursula K. LeGuin
One Flew Over the Cuckoo's Nest, Ken Kesey
All the King's Men, Robert Penn Warren
Childhood's End, Clarke
Animal Farm, Orwell
Fahrenheit 451, Bradbury
Art and Man, "The Master Builders"
Art and Man, "The Future"
The Norton Anthology of Short Fiction, R. V. Cassill
"The New Atlantis", Ursula K. Le Guin
The Communist Manifesto, Karl Marx
The Declaration of Independence, Constitution of the United States, Bill of Rights, Amendments to the Constitution

Audio-Visual Materials

"Utopia" - Art and Man
"Man and His Environment: In Harmony and Conflict" - The Center for the Humanities, Inc.
"Man and His Values: An Inquiry into Good and Evil" - The Center for the Humanities, Inc.
"Athens - The Golden Age" - (MP3-0125)
"Civilization - Worship of Nature" - (MP3-1911)
"Drive for Power", Parts I and II - Ascent of Man Series - (MP3-2528)
"Civilization - The Faccacies of Hope" - (MP3-1883)
"The Speaker: A Film about Freedom" - (MP3-5016)
"The Dehumanizing City" - (MP2-6558)
"Politics, Power and the Public Good" - (MP2-6564)
"The Hat" - (MP2-1253)
"Neighbors" - (MP1-1844)
"Time Out of War" - (MP2-2889)
"Toys on a Field of Blue" - (MP2-4942)
"Wargames" - (MP2-4945)
"Marxism: The Theory that Split a World" - (MP3-2220)
"Future Shock" - (MP3-4155)
"Science Fiction Series" - (MP2-7470, 71, 72)

Sample Activities:

1. Read Thoreau's Walden and view filmstrip (available from Alpha Project, Montgomery County). Relate these to Stuart Chase's "A Very Private Utopia". Debate whether Utopia can be a plan for individual happiness or whether it must encompass a society.

2. Utopian proposals can serve as models to be implemented or as models to be avoided, the latter being called anti-utopias or dysutopias. Identify the intent of the utopias you've read from the reading list and your own research. Are there any models intended for implementation that you find reprehensible? For what reasons? Explain your reasons in essay form; debate if others in the class disagree.

3. Investigate the role of the family in utopian literature and in utopian societies. Why is the family virtually abolished in so many of these plans? Discuss your findings and their implications in a seminar or panel discussion format.

4. Read Walden II by B. F. Skinner and compare it to Brave New World.

5. Write a story that describes a method of controlling human behavior as a prerequisite to the creation of a Utopia.

6. Many see technology as a threat to human values and even to human life; others view it more optimistically. What are the dangers that technology poses? what are its promises? Survey the man on the street (or the student in the hallway) to discover what these hopes and fears are. Graph your findings following acceptable form.

7. Investigate the role of the arts in utopian literature and utopian societies. Notice particularly their virtual absence in 1984 and their trivilization in Brave New World. Consider that Plato would accept only patriotic and religious poets in his Republic. What is the role of the arts in democracies and in communist states? Present your findings in a multi-media presentation.

8. Role play some of the authors and political or economic philosophers studied in this unit using a "Meeting of Minds" format. (For another model, read Durant's treatment of a similar dialogue in The Pleasures of Philosophy: Part VIII).

9. Create a game which will apply some of the ideas and conflicts met in this utopian unit. Devise rules, objectives; design format. Teach the class how to play it.

10. Listen to national anthems and to music which expresses strong nationalism, such as Smetana's "Moldau" and Sibelius' "Finlandia". Try to locate or compose some music which would celebrate the world as a community. View the film "Leonard Bernstein and the New York Philharmonic in Berlin", Part I (MP3-0793) so that you can consider Bernstein's theory that certain music transcends national boundaries.

11. Read The Greening of America by Charles Reich and The Third Wave by Alvin Toffler. Is such optimism warranted or do you detect "blind spots" in their reasoning? Write your own projection of the future of America or of the world. Read The Futurists magazine and "Global Year 2000: a report to the President" to obtain viewpoints that are less optimistic than Reich's and Toffler's.

12. Research the myth of Atlantis. Include in your reading Francis Bacon's "The New Atlantis" and Jules Verne's 20,000 Leagues Under the Sea as well as more scientific investigations. Give your theories about the myth in a multi-media presentation.

13. Design an ideal home in an ideal community with an ideal school, recreation and working facilities. Consult the architectural ideas of Le Corbusier, R. Buckminster Fuller and those of Paoli Soleri for inspiration. Use a multi-media presentation.

14. A futurists' vision depends partly upon his/her specialty and partly upon his/her personal feelings of optimism or pessimism about the operations of "human nature" past and present. Research one of the following futurists, determine his/her specialty and point of view, and present your findings in seminar:

--Herman Kahn: On Thermonuclear War, Thinking About the Unthinkable, The Year 2000.

--Alvin Toffler: Future Shock, The Futurists, The Eco-Spasm Report

--Buckminster Fuller: Nine Chains to the Moon, Utopia or Oblivion, Operating Manual for Spaceship Earth

--Arthur C. Clarke: Profiles of the Future, Voices from the Sky, The Promise of Space, Imperial Earth

--Sir Fred Hoyle: Encounter With the Future

--Ray Bradbury: The Martian Chronicles, Fahrenheit 451

--Isaac Asimov: I. Robot

15. Investigate futures - related topics from recent issues of The Futurist magazine. Demonstrate, in discussion or writing, the inter-relatedness between several of the topics, such as those listed below:

--Disappearing Jobs: The Impact of Computers on Employment
--Whither Weather? The Future of Biometeorology
--The Future of the Family: Intimacy in an Age of Lonliness
--A New Type of City for an Energy-Short World
--Fuel Farms: Croplands of the Future?
--The 1980's: A Decade of Hunger?
--Crime in the Year 2000
--The Future of Religion in a Post - Industrial Society
--The Extra Dimension: Urban Architecture for Tomorrow
--Hello! My Name is 1069

16. Psychoscientist David Goddman, a long-time student of George Orwell's 1984, reports that of the 137 predictions in the novel, over 100 have come true! What suggestions, in essay form, can you make for reducing the likelihood of a future resembling 1984?

Man's Search for Immortality: Can He Overcome Death?

To be man is to strive to be God.

Jean Paul Sartre

Belief in immortality secures a bond of union between the living and the dead, which is a fact of immense importance for the continuity of culture and for the safe keeping of tradition.

Ashley Montagu

O my soul, do not aspire to immortal life, but exhaust the limits of the possible.

Pindar

Suggested Readings

Philosophy: An Introduction to the Art of Wondering, Christian (Chap. 8-3, pp. 527-549)
Ethics for Modern Life, Abelson and Friquegnon
Part One: The Morality of Taking Life (pp. 1-127)
Chap. 1 Suicide: Aquines, Hume
Chap. 2 Euthanasia: Kamisar, Williams
Chap. 3 Abortion: Ramsey, Tooley, Callahan
Chap. 4 War and Terrorism: Brandt, Margolis
Death Be Not Proud, Guenther
Everyman, Anonymous
The Dumb Waiter, Pinter
The Seventh Seal, Bergman
Emperor Jones, O'Neill
The Crucible, Miller
The Stranger, Camus
O The Chimneys, Sachs
Nobel Parade, McDonnell
"Masque of Red Death", Poe
"The Death of Ivan Ilych", Tolstoy
"An Occurence at Owl Creek Bridge", Bierce
"The Jilting of Granny Weatherall", Porter
"Idiots First", Malamud
"Patriotism", Mishima
"Death, Be Not Proud", Donne
"I Heard a Fly Buzz - When I Died", Dickinson
"To An Athlete Dying Young", Houseman
"Richard Cory", Robinson
"Do Not Go Gentle Into That Good Night", Thomas
"After a Time", Davis
"Dying if Fine, But Death", Cummings
"The Lottery", Jackson
"A Good Man Is Hard to Find", O'Connor

Audio-Visual Materials

Extending Life: Science-New Frontiers Series - 15 min. (MP2-6743)
And I Want Time - 28 min. (MP3-5265)
Myths of the Pharoahs - 13 min. (MP2-7634)

Sample Activities:

1. Select the literary works which treat death and dying in a manner most closely mirroring your own attitudes toward mortality. Which contradict your attitudes? Isolate the elements in each selection responsible for your response and discuss them.

2. State the argument against resignation to death made in Thomas Dylan's-"Do Not Go Gentle Into That Good Night". State the argument of Catherine Davis' reply, "After a Time". Categorize other poetry read to support each position.

3. Examine the concept of a future savior in the Christian, Islamic, Buddhist and Judaic faiths. What comparisons can be made between them? Discuss your findings and conclusions by organizing and conducting a seminar with others in the class.

4. Write a composition choosing one of the following:
   --How your feelings about your life would change if you expected to live three hundred years.
   --How your feelings about your life would change if "beings" were discovered in the universe who were virtually immortal.

5. Our endless contemplations of various heavens and hells reflects the conviction that we do not really die--that we are immortal. Research evidence of this belief throughout history in a particular culture and make a multi-media presentation of your research to the class, describing the various images of after-life as reflected in religious and cultural beliefs.

6. Review and clarify in your own mind the impirical and rational arguments for and against immortality. Which of these arguments are most persuasive? On the basis of these four arguments, what is your conclusion regarding the existence of personal immortality? Present your conclusion in an essay format.

7. Read "The Wall" by Jean-Paul Sartre and The Stranger by Albert Camus, two authors classified as modern existentialists. Do the two main characters--Pable ("The Wall") and Meursault (The Stranger) reflect the existentialist viewpoint that human existence is meaningless and that there is nothing after death? If so, how? If not, why not? Debate your position within a small group, then with the entire class.

8. Meet with and interview local clergymen from a variety of religion persuasions. Focus in on questions that regard the beliefs and dogmas held by the religious institution these clergy represent. Organize and compare your findings in a format to be shared with the class--either a written report, synopsis, or oral presentation.